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**CITY OF METHUEN
METHUEN HISTORIC DISTRICT COMMISSION**

SEARLES BUILDING, SUITE 217
41 PLEASANT STREET
METHUEN, MA 01844
(978) 983-8560 / Fax (978) 983-8976

APPLICATION FOR CERTIFICATE

Please refer to the official Historic District Commission meeting schedule for meeting dates (typically held the fourth Thursday of the month) and their associated submission deadlines.

Please submit the following, to the Department of Economic and Community Development, 41 Pleasant Street, Suite 217 by the appropriate submission deadline:

- A **\$25.00 application fee** in the form of a check payable to "City of Methuen"
- **One original and ten (10) copies—ELEVEN (11) TOTAL** of:
 - The completed application.
 - Secured to each copy of the application: Photographs, material and color samples, manufacturer's illustrations, plans and elevations, shop drawings, site or plot plan, and any other applicable exhibits needed to best inform Commissioners of your proposed actions. **Sign applications** must include dimensions, accurate color samples (paint chips), materials, location, method of display, an image of the proposed sign at an appropriate scale in its proposed location, and an image of any existing signs. Note whether the sign is new or replaces an existing sign.

Applications will not be accepted if incomplete, missing copies, or with unpaid fees.

- If your application requires a public hearing (please inquire at the Department of Economic and Community Development), your application must also include:
 - A certified Historic District Commission abutter's list, obtained from the Assessor's office in Suite 103, 978-983-8530 (**\$35.00** to City of Methuen).
 - Self-address, stamped envelopes, for each of the abutters and the applicant. If the City of Methuen, 41 Pleasant Street is listed as an abutter, no stamp is required on the addressed envelope. **DO NOT INCLUDE A RETURN ADDRESS.**

Applicants, or their representatives, are expected to be present at the meeting during which their application is discussed. Otherwise, the application is subject to removal from the agenda. Application decisions may require more than one meeting.

If any change in use of occupancy or location, or increase in square footage, height, or enclosed space (including garages) is proposed, certification that a ZONING VARIANCE has been issued by the Methuen Zoning Board of Appeals is required. The Commission will NOT hold a hearing on the Application before that certification is issued.

Name of Applicant/Contact: Nate Howard

Site Location of Application: 255 Broadway, Methuen, MA 01844

Business Name (or N/A): Enterprise Bank

Applicant Mailing Address: 128 Warren St

City, State, Zip: Lowell, MA 01852

Telephone/Fax #'s: 207-446-1350 /

E-mail: nhoward@nrgtree.com

Check type of Certificate applying for:

X **CERTIFICATE OF APPROPRIATENESS** for work described and exhibits filed.

CERTIFICATE OF NON-APPLICABILITY for the following reason(s):

- Not visible from public street, way, place or body of water
- Reconstruction similar to original following fire or other disaster
- Maintenance, repair, or replacement, using same design, materials, colors
- No architectural features involved
- Proposed work complies with guidelines
- Other

CERTIFICATE OF HARDSHIP, financial or otherwise described herein and not a substantial derogation from intent and purposes of law.

DESCRIPTION OF PROPOSED WORK. Proposed project and current site conditions:

53 Solar Panels on Roof

Proposed Start Date:	<u>12/1/23</u>	Proposed Completion Date:	<u>12/7/23</u>
Name of Contractor:	<u>NRG Tree</u>		
Contact Person:	<u>Halil Aslan</u>		
Address:	<u>7 Vinal St</u>		
City, State, Zip:	<u>Dracut, MA 01826</u>		
License #:	<u>169749</u>		
Telephone/Fax #'s:	<u>978-601-9083</u> / <u></u>		
E-mail:	<u>halilusta71@yahoo.com</u>		

Name of Architect: _____
Contact Person: _____
Address: _____
City, State, Zip: _____
Mass. Reg. #: _____
Telephone/Fax #'s: _____ / _____
E-mail: _____

DOCUMENTATION ATTACHED:

- ____ Photographs
- ____ Materials and/or Color Samples
- ____ Manufacturer's Illustration
- X Plans and Elevations
- ____ Shop Drawing(s)
- X Site or Plot Plan
- ____ Abutters List
- ____ Stamped envelopes, pre-addressed to abutters
- ____ Other

Failure to submit the appropriate materials, substantial information, and/or application fee will result in rejection of this application as incomplete.

CERTIFICATION:

The applicant hereby certifies that this application is complete and accurate, to the best of his/her knowledge, and that no material misrepresentation is made herein.

Applicant(s): Nate Howard
Nate Howard (Oct 30, 2023 16:29 EDT)

Signature(s)

10/30/2025

Date

Contractor: Halil Aslan
Halil Aslan (Oct 30, 2023 17:28 EDT)

Signature

10/30/23

Date

CITY OF METHUEN

Final Audit Report

2023-10-30

Created:	2023-10-30
By:	Alyssa Ranieri (aranieri@nrgtree.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAARJC-uCf0o6tIJV6yrcc5J5hNhUzvKYXp

"CITY OF METHUEN" History

-  Document created by Alyssa Ranieri (aranieri@nrgtree.com)
2023-10-30 - 8:28:10 PM GMT
-  Document emailed to Nate Howard (nhoward@nrgtree.com) for signature
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-  Document e-signed by Halil Aslan (halilusta71@yahoo.com)
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Adobe Acrobat Sign

53 MODULES-ROOF MOUNTED-20.935 kW DC, 17.300 kW AC, 255 BROADWAY, METHUEN, MA 01844

SYSTEM SIZE:	20.935 kW DC 17300 kWAC
MODULE TYPE & AMOUNT:	(53) CANADIAN C56R-395 MS-HL
MODULE DIMENSIONS:	(LW/H) 67.5"/44.6"/1.38"
INVERTER:	(1) SOLAREEDGE SE17.3KUS
OPTIMIZER:	(27) SOLAREEDGE P980
INTERCONNECTION METHOD:	UTILITY SIDE

COVERING CODES
ALL WORK SHALL CONFORM TO THE FOLLOWING CODES

1. 2020 NATIONAL ELECTRICAL CODE
2. 2015 INTERNATIONAL COMMERCIAL CODE
3. 2015 NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION

- a. INSTALLATION OF SOLAR PHOTOVOLTAIC SYSTEM SHALL BE IN ACCORDANCE WITH NEC ARTICLE 690, AND ALL OTHER APPLICABLE NEC CODES WHERE NOTED OR EXISTING.
- b. PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL COMPLY WITH NEC ARTICLE 110.
- c. ALL CONDUCTORS, INCLUDING THE GROUNDING ELECTRODE CONDUCTOR SHALL BE PROTECTED FROM PHYSICAL DAMAGE IN ACCORDANCE WITH NEC ARTICLE 250.
- d. THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE; THIS SYSTEM IS UTILITY INTERACTIVE PER UL 1741 AND DOES NOT INCLUDE STORAGE BATTERIES OR OTHER ALTERNATIVE STORAGE SOURCES.
- e. ALL DC WIRES SHALL BE SIZED ACCORDING TO [NEC 690.38]
- f. DC CONDUCTORS SHALL BE WITHIN PROTECTED RACEWAYS IN ACCORDANCE WITH [NEC 690.31]
- g. ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL JURISDICTIONAL BUILDING CODE.
- h. PV MODULES TO BE RATED UL 1703 CLASS C FIRE RATING OR BETTER.
- i. ALL EQUIPMENT TO BE CERTIFIED BY A NATIONALLY RECOGNIZED TESTING LABORATORY.

PV 00:	COVER SHEET
PV 10:	SITE PLAN
PV 11:	Z-RACK LAYOUT
E 11:	3-LINE DIAGRAM
E 12:	3-LINE DIAGRAM
E 13:	NOTES
E 14:	WARNING LABELS
	EQUIPMENT SPEC.

ROOF ACCESS POINT SHALL NOT BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER OPENINGS SUCH AS WINDOWS OR DOORS, AND LOCATED AT STRONG POINTS OF BUILDING CONSTRUCTION IN LOCATIONS WHERE THE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREE LIMBS, WIRES OR SIGNS.



SCALE: 1/32" = 1'-0"

SCALE: NT\$



SCAIFE-NT

Signature Mh Seal
8/21/2023



255 BROADWAY
255 BROADWAY,
METHUEN, MA 01844

nr|Fee
128WARREN ST
LOWELL, MA 01852

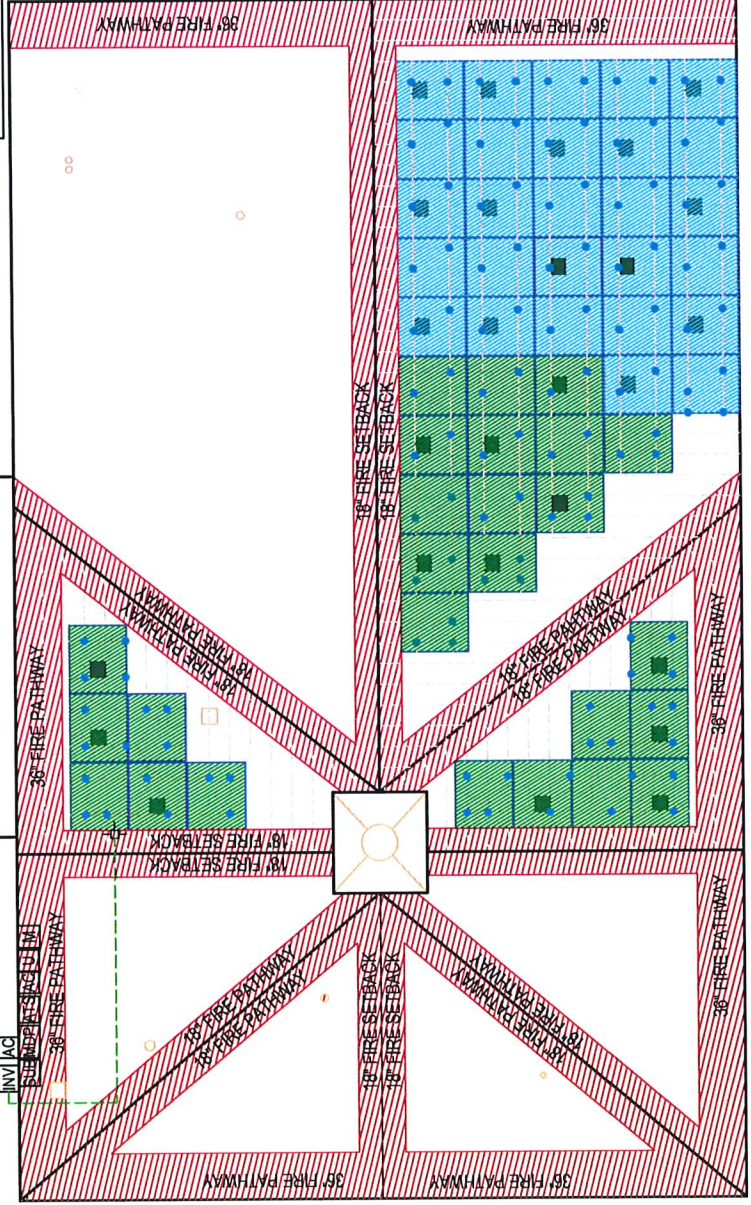
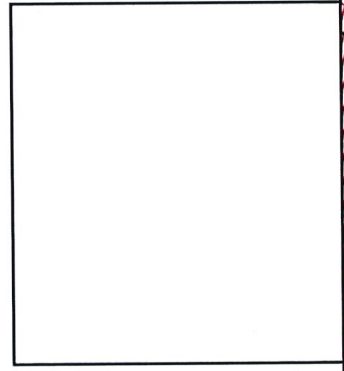
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MAX ATTACHMENT SPACING 48"



FRONT OF HOUSE
BROADWAY

1 SITE PLAN
PV 1.0
SCALE: NTS

MODULE, ARRAY WEIGHT (LOAD CALC'S)			
Number of Modules	53		
Module Weight	49.4	LBS	
Total Module (Array) Weight	2618.20	LBS	
Mounting System Weight	186.00	LBS	
Total System Weight (Module Weight + Mounting System Weight)	2804.20	LBS	
Weight at Each Attachment Point (Array Weight / Number of Attachment Points)	21.11	LBS	
Module Area (67.8"x44.6")	21.00	SqFt	
Total Array Area	1112.96	SqFt	
Distributed Load (Total System Weight / Total Array Area)	2.42	Per SqFt	
Total Roof Area	3622	SqFt	
Total Percentage of Roof Covered (Total Array Area / Total Roof Area)*100	30.73%		

SYSTEM LEGEND			
[M]	EXISTING INTERIOR MAIN SERVICE PANEL & POINT OF INTERCONNECTION		
[U]	INTERIOR UTILITY METER #6380855		
[AQ]	SERVICE DISCONNECT		
[ATS]	EXISTING ATS		
[MDP]	EXISTING MAIN DISTRIBUTION PANEL		
[SUB]	EXISTING AC SUB PANELS		
[AC]	NEW 240' UTILITY ACCESSIBLE/LOCKABLE PV AC DISCONNECT		
[INV]	NEW SOLAREEDGE SE17.3KUS INVERTER		
[53]	53 NEW CANADIAN CSR-395 MS-HL MODULES WITH SOLAREEDGE OPTIMIZER MOUNTED ON THE BACK OF EACH MODULES.		
[1]	NEW 1 - SE17.3KUS INVERTER		
[FIRE PATHWAY]	= FIRE PATHWAY		
[ROOF OBSTRUCTIONS]	= ROOF OBSTRUCTIONS		
[ATTIC RUN]	= ATTIC RUN		
[EXTERIOR RUN]	= EXTERIOR RUN		
[CONDUIT ROOF TOP JUNCTION BOX]	= CONDUIT ROOF TOP JUNCTION BOX		
[CONDUIT ATTIC RUN JUNCTION BOX]	= CONDUIT ATTIC RUN JUNCTION BOX		

ROOF SECTIONS	
ROOF #01	MODULE - 40 SLOPE - 40° AZIMUTH - 285° MATERIAL - COMP SHINGLE RAFTER SIZE & SPACING - 2'X12' @ 16" O.C.
ROOF #02	MODULE - 13 SLOPE - 40° AZIMUTH - 165° MATERIAL - COMP SHINGLE RAFTER SIZE & SPACING - 2'X12' @ 16" O.C.

STRING(S)	
[Blue Hatched Box]	STRING #1 - 27 MODULES
[Green Hatched Box]	STRING #2 - 26 MODULES



128 WARREN ST
LOWELL, MA 01852
NRGTREE CONSULTING LTD

Revisions	Date	Rev
Initial Design	06/06/2023	00
Rev	08/11/2023	01

Signature with Seal
8/21/2023
Professional Engineer
No. 53123
Exp. 8-21-2024

255 BROADWAY
255 BROADWAY,
METHUEN, MA 01844

Sheet Name
SITE PLAN

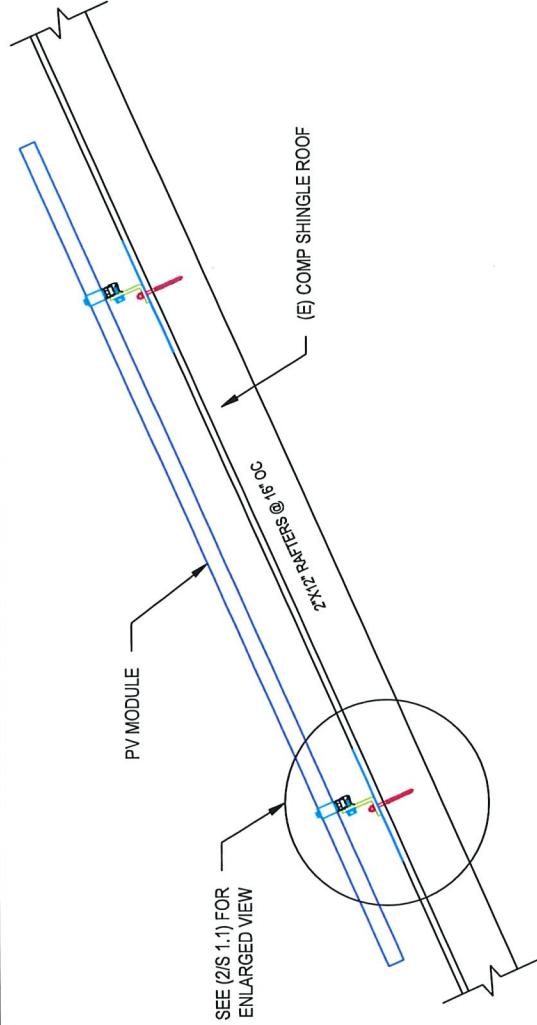
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PV 1.0

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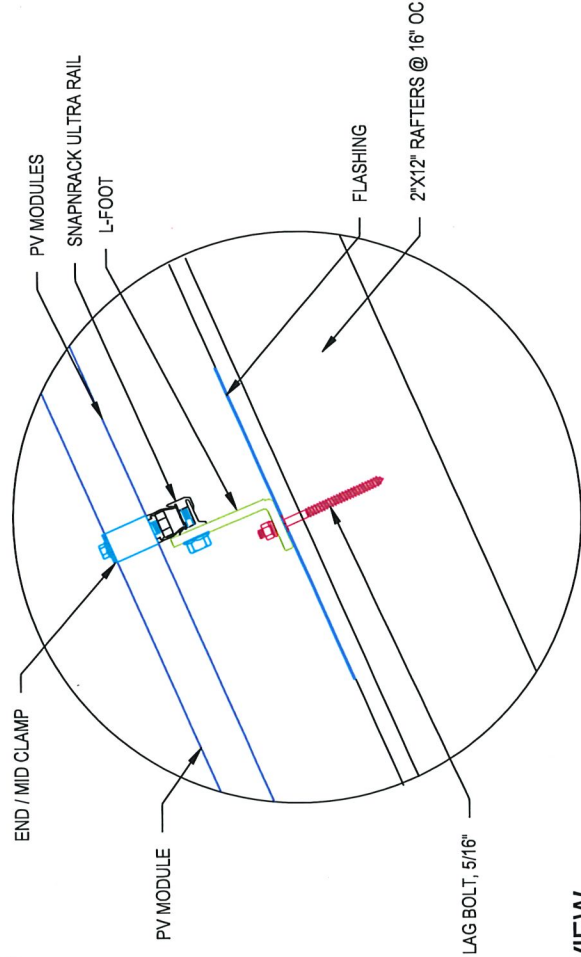
GENERAL STRUCTURAL NOTES:

1. THE SOLAR PANELS ARE TO BE MOUNTED TO THE ROOF FRAMING USING THE SNAPRACK COMPOSITION. THE MOUNTING FEET ARE TO BE SPACED AS SHOWN IN THE DETAILS, AND MUST BE STAGGERED TO ADJACENT FRAMING MEMBERS TO SPREAD OUT THE ADDITIONAL LOAD.
2. UNLESS NOTED OTHERWISE, MOUNTING ANCHORS SHALL BE 5/16" LAG SCREWS WITH A MINIMUM OF 2-1/2" PENETRATION INTO ROOF FRAMING.
3. THE PROPOSED PV SYSTEM ADDS 2.6 psf TO THE ROOF FRAMING SYSTEM.
4. ROOF LIVE LOAD = 20 psf TYPICAL, 0 psf UNDER NEW PV SYSTEM.
5. GROUND SNOW LOAD = 50 psf
6. WIND SPEED = 116 mph
7. EXPOSURE CATEGORY = B



1 ATTACHMENT DETAIL (SIDE VIEW)

SCALE: NTS



2 ATTACHMENT DETAIL ENLARGED VIEW

SCALE: NTS

REVISIONS		
Revision	Date	By
Initial Design	08/08/2023	01
Rev.	08/11/2023	01

Signature with Seal

8/21/2023



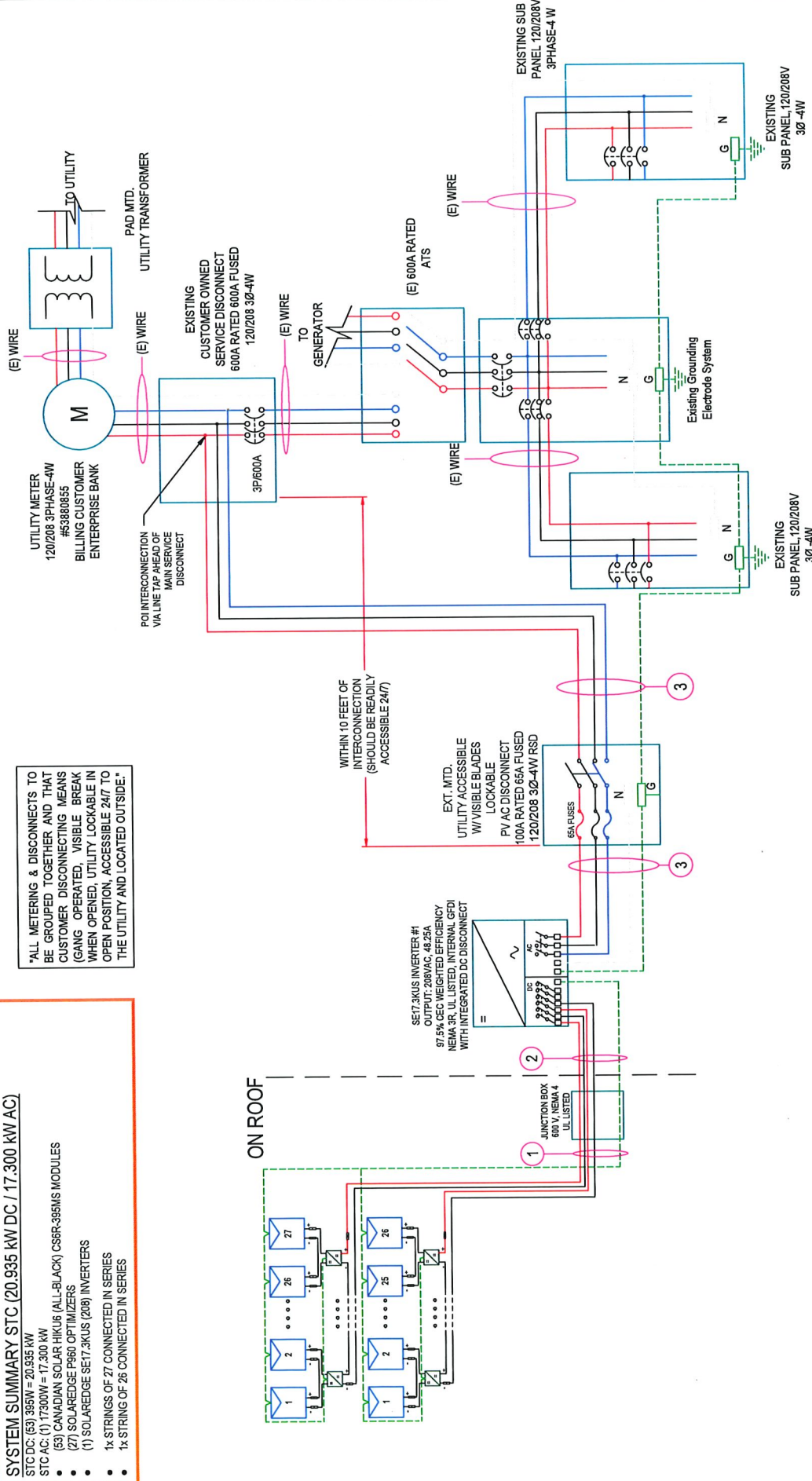
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METHUEN, MA 01844

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MOUNT DETAIL

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WIRE TAG #	WIRE FROM --	CONDUIT	WIRE QTY	WIRE GAUGE:	ESTIMATED DISTANCE	WIRE TYPE	TEMP RATING:	WIRE AMP	TEMP DE-RATE:	CONDUIT FILL:	WIRE OCP:	TERMINAL 75°C RATING:	STRING / WATTAGE	OPERATING VOLTAGE	STRING AMPS	x NEC:	MAX AMPS	MAX SYSTEM VOLTAGE	GRND SIZE	GRND WIRE TYPE
①	ARRAY TO JUNCTION BOX	IN AIR	4	#10	10'-0"	PV WIRE	90°	40A x	0.96A x	0.80A x	30.72A	35A	10665 /	370	=	28.82 x 1.25	=	36.03A	#6	SBC
②	JUNCTION BOX TO INVERTER	3/4" EMT	4	#8	50'-0"	THWN-2	90°	50A x	0.76A x	0.80A x	30.40A	50A	10665 /	370	=	28.82 x 1.25	=	36.03A	#8	THWN-2
③	INVERTER TO MSP	3/4" EMT	4	#6	10'-0"	THWN-2	75°	65A x	0.94A x	1.00A x	61.10A	65A	/		=	48.25 x 1.25	=	60.31A	#8	THWN-2

INVERTER CHARACTERISTICS- SOLAREEDGE SE 17.3KUS			
MAX OUTPUT POWER	17300	W	
SYSTEM OPERATING VOLTAGE	600	V	
MAX CONTINUOUS OUTPUT CURRENT	48.25	A	
MAX INPUT VOLTAGE	370	V	
SYSTEM SHORT CIRCUIT CURRENT	14.1	A	
MAX EFFICIENCY	97.5	%	

OPTIMIZER SPECIFICATIONS	
MANUFACTURER	SOLAREEDGE P960
DC INPUT POWER	960 W
DC MAX INPUT VOLTAGE	60 V
MAXIMUM SHORT CIRCUIT	11.6A
DC MAX OUTPUT CURRENT	18A
MAX INPUT VOLTAGE	600A

PV MODULE RATING @ STC	
MANUFACTURER	CANADIAN CSBR-395 M6-HL
MAX. POWER-POINT CURRENT (IMP)	12.51 AMPS
MAX. POWER-POINT VOLTAGE (VMP)	30.6 VOLTS
OPEN-CIRCUIT VOLTAGE (VOC)	36.6 VOLTS
SHORT-CIRCUIT CURRENT (ISC)	13.77 AMPS
NOM. MAX. POWER AT STC (PMAX)	395 WATT
MAX. SYSTEM VOLTAGE	1000V
VOC TEMPERATURE COEFFICIENT	-0.27* %°C

Rooftop conductor ampacities designed in compliance with art. 690.8, Tables 310.15(B)(2)(a), 310.15(B)(3)(a), 310.15(B)(3)(c), 310.15(B)(16), Chapter 9 Table 4, 5, & 9. Location specific temperature obtained from ASHRAE 2017 data tables

RECORD LOW TEMP	-17°
AMBIENT TEMP (HIGH TEMP 2%)	32°
CONDUIT HEIGHT	0.5'
ROOF TOP TEMP	54°
CONDUCTOR TEMPERATURE RATE	90°

PHOTOVOLTAIC SYSTEM	
DC SYSTEM SIZE (WATTS)	20935W
AC SYSTEM SIZE (WATTS)	17300W
TOTAL NUMBER OF MODULES	53
NOMINAL AC VOLTAGE	208V

SYSTEM NOTES:

1. PV SYSTEM IS UNDERGROUND
2. MODULES ARE BONDED TO RAIL USING UNIREC RM5 INTEGRATED GROUNDING.
3. RAILS ARE BONDED USING UL 2703 RATED LAY-IN LUGS
4. BARE COPPER IS TRANSITIONED TO THHN/THWN-2 VIA IRREVERSIBLE CRIMP; GEC TO BE CONTINUOUS PER CEC 250.64(C)

SOLAREEDGE NOTES:

1. STRING OPERATING VOLTAGE IS CONTROLLED BY INVERTER AND MAINTAINED AT NOMINAL 370 VDC.
2. STRING VOLTAGE IS LIMITED BY INVERTER TO A MAXIMUM OF 600VDC
3. SOLAREEDGE DC/DC OPTIMIZERS ARE ALL RUN IN SERIES PER STRING (FIXED SOURCE CIRCUIT VOLTAGE - DC/DC CONVERTERS)
4. STRING CURRENT IS CONTROLLED BY OPTIMIZERS AND IS LIMITED TO 18ADC MAX (PER STRING).
5. INTEGRATED SOLAREEDGE DC SWITCH DISCONNECTS BOTH POSITIVE AND NEGATIVE CONDUCTORS AS REQUIRED BY NEC 680.35(A).
6. SOLAREEDGE INVERTERS ARE ALL RAPID SHUTDOWN READY PER NEC 680.12
7. SOLAREEDGE INVERTER IS SMART INVERTER COMPLIANT PER MASSACHUSETTS RULE 21.



REVISIONS		
Description	Date	Rev
Initial Design	06/06/2023	00
Rev.	08/11/2023	01

Signature with Seal

Project Name & Address

255 BROADWAY
255 BROADWAY,
METHUEN, MA 01844

Sheet Name
ELECTRICAL
SPECIFICATIONS

Sheet Size

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11" X 17"

Sheet Number

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NOTES

1. THIS SYSTEM SHALL COMPLY WITH ALL APPLICABLE CODES INCLUDING: THE 2019 MASSACHUSETTS BUILDING CODE, MASSACHUSETTS FIRE CODE, Massachusetts ELECTRIC CODE, MASSACHUSETTS MECHANICAL CODE, Massachusetts RESIDENTIAL CODE, MASSACHUSETTS PLUMBING CODE, MASSACHUSETTS BUILDING STANDARDS CODE, MASSACHUSETTS HEALTH AND SAFETY CODE, IEEE STANDARD 929, UL STANDARD 1741, 2019 RESIDENTIAL CODE, AND THE MANUFACTURERS' LISTINGS AND INSTALLATION INSTRUCTIONS.
2. ALL WORK TO COMPLY WITH CEC ARTICLE 690
3. UTILITY SHALL BE NOTIFIED BEFORE ACTIVATION OF PV SYSTEM
4. REMOVAL OF A UTILITY-INTERACTIVE INVERTER OR OTHER EQUIPMENT SHALL NOT DISCONNECT THE BUILDING CONNECTION BETWEEN THE GROUNDING ELECTRODE CONDUCTOR AND THE PV SOURCE AND/OR OUTPUT CIRCUIT GROUNDING CONDUCTOR
5. ALL PV SYSTEM COMPONENTS SHALL BE LISTED BY A RECOGNIZED TESTING AGENCY
6. WIRING MATERIALS SHALL COMPLY WITH MAXIMUM CONTINUOUS CURRENT OUTPUT AT 25° C; WIRE SHALL BE WET RATED AT 90°C
7. EXPOSED PHOTOVOLTAIC SYSTEM CONDUCTORS ON THE ROOF WILL BE USE-2 OR PV TYPE WIRE.
8. ALL EXTERIOR CONDUIT, FITTINGS, AND BOXES SHALL BE RAIN-TIGHT AND APPROVED FOR USE IN WET LOCATIONS (NEC 314.15)
9. ALL METALLIC RACEWAYS AND EQUIPMENT SHALL BE BONDED AND ELECTRICALLY CONTINUOUS (NEC 250.90, 250.96)
10. FOR UNGROUNDED SYSTEMS, THE PHOTOVOLTAIC SOURCE AND OUTPUT CIRCUITS SHALL BE PROVIDED WITH A GROUND-FAULT PROTECTION DEVICE OR SYSTEM THAT DETECTS A GROUND FAULT, INDICATES THAT FAULT HAS OCCURED, AND AUTOMATICALLY DISCONNECTS ALL CONDUCTORS OR CAUSES THE INVERTER TO AUTOMATICALLY CEASE SUPPLYING POWER TO OUTPUT CIRCUITS (CEC 690.35(C))
11. ANY REQUIRED GROUNDING ELECTRODE CONDUCTOR WILL BE CONTINUOUS, EXCEPT FOR SPLICES OR JOINTS AT BUSBARS WITHIN LISTED EQUIPMENT (CEC 250.64C)
12. ALL PV MODULES AND ASSOCIATED EQUIPMENT SHALL BE PROTECTED FROM ANY PHYSICAL DAMAGE
13. ALL FIELD-INSTALLED JUNCTION, PULL, AND OUTLET BOXES LOCATED BEHIND MODULES SHALL BE ACCESSIBLE DIRECTLY OR BY DISPLACEMENT OF A MODULE SECURED BY REMOVABLE FASTENERS
14. FOR GROUNDED SYSTEMS, THE INVERTER IS EQUIPPED WITH GROUND FAULT PROTECTION AND A GFI FUSE PORT FOR GROUND FAULT INDICATION
15. WHEN BACKFED BREAKER IS THE METHOD OF UTILITY INTERCONNECTION, THE BREAKERS SHALL NOT READ "LINE AND LOAD"
16. THE INSTALLED SOLAR SYSTEM HAS A DISTRIBUTED WEIGHT OF LESS THAN 4 PSF
17. THE CONCENTRATED LOAD FOR EACH VERTICAL SUPPORT IS LESS THAN 45 LBS
18. AC DISCONNECT IS A "KNIFE BLADE" TYPE DISCONNECT
19. THE WORKING CLEARANCES AROUND THE EXISTING ELECTRICAL EQUIPMENT AS WELL AS THE NEW ELECTRICAL EQUIPMENT WILL BE MAINTAINED IN ACCORDANCE WITH NEC 110.26
20. THE PHOTOVOLTAIC INVERTER WILL BE LISTED AS UL 1741 COMPLIANT
21. SMOKE ALARMS AND CARBON MONOXIDE ALARMS ARE REQUIRED TO BE RETROFITTED ONTO THE EXISTING DWELLING AS PER THE 2019 CRC. THESE SMOKE ALARMS ARE REQUIRED TO BE IN ALL BEDROOMS, OUTSIDE EACH BEDROOM, AND AT LEAST ONE ON EACH FLOOR OF THE HOUSE. CARBON MONOXIDE ALARMS ARE REQUIRED TO BE RETROFITTED OUTSIDE EACH BEDROOM AND AT LEAST ONE ON EACH FLOOR OF THE HOUSE. THESE ALARMS MAY BE SOLELY BATTERY OPERATED IF THE PHOTOVOLTAIC PROJECT DOES NOT INVOLVE THE REMOVAL OF INTERIOR WALL AND CEILING FINISHES INSIDE THE HOME; OTHERWISE, THE ALARMS MUST BE HARD WIRED AND INTERCONNECTED. (CRC R314, R315)
22. SMOKE AND CARBON MONOXIDE ALARMS ARE REQUIRED PER CRC SECTIONS R314 AND 315 TO BE VERIFIED AND INSPECTED BY THE INSPECTOR IN THE FIELD.
23. WHEN APPLYING THE 120% RULE OF CEC 705.12(D)(2), THE SOLAR BREAKER TO BE POSITIONED AT THE OPPOSITE END OF THE BUS FROM THE MAIN BREAKER PER 705.12(D)(7)
24. PLUMBING AND MECHANICAL VENTS THROUGH THE ROOF SHALL NOT BE COVERED BY SOLAR MODULES - NO BUILDING, PLUMBING, OR MECHANICAL VENTS TO BE COVERED OR OBSTRUCTED

REVISIONS			
Description	Date	Rev	
Initial Design	06/06/2023	01	
Rev.	08/11/2023	01	

Signature with Seal

Project Name & Address

255 BROADWAY
255 BROADWAY,
METHUEN, MA 01844

Sheet Name

NOTES

Sheet Size

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11" X 17"

Sheet Number

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WARNING

ELECTRICAL SHOCK HAZARD

DO NOT TOUCH TERMINALS,
TERMINALS ON LINE AND LOAD
SIDES MAY BE ENERGIZED IN
THE OPEN POSITION

LABEL LOCATION:
INVERTER(S), AC DISCONNECT(S), AC
COMBINER PANEL (IF APPLICABLE),
PER CODE(S): NEC 2014: 690.17(B),
NEC 2014: 690.17(E), NEC 2011: 690.17(4)

WARNING

ELECTRICAL SHOCK HAZARD

THE DC CONDUCTORS OF THIS
PHOTOVOLTAIC SYSTEM ARE
UNGROUNDING AND MAY BE
ENERGIZED

LABEL LOCATION:
INVERTER(S), DC DISCONNECTS,
PER CODE(S): NEC 2014: 690.35(F),
NEC 2011: 690.35(F)

WARNING

INVERTER OUTPUT CONNECTION

DO NOT RELOCATE THIS
OVERCURRENT DEVICE

LABEL LOCATION:
ADJACENT TO PV BREAKER (IF APPLICABLE),
PER CODE(S): NEC 2014: 705.12(B),
NEC 2014: 705.12(D)(3)(b), NEC 2011: 705.12(D)(7)

WARNING: PHOTOVOLTAIC
POWER SOURCE

LABEL LOCATION:
INTERIOR AND EXTERIOR DC CONDUIT EVERY 10 FT. AT EACH
TURN, ABOVE AND BELOW PENETRATIONS, ON EVERY J-BPULL
BOX CONTAINING DC CIRCUITS.
PER CODE(S): NEC 2014: 690.31(G)(3),
690.31(G)(4), NEC 2011: 690.31(E)(3), 690.31(E)(4), IFC 2012:
605.11.1.4

PHOTOVOLTAIC AC DISCONNECT

MAXIMUM AC OPERATING CURRENT: 48.25AMPS
NOMINAL OPERATING AC VOLTAGE: 208 VAC

LABEL LOCATION:
AC DISCONNECT(S), PHOTOVOLTAIC SYSTEM POINT OF
INTERCONNECTION,
PER CODE(S): NEC 2014: 690.54, NEC 2011: 690.54

WARNING

ELECTRICAL SHOCK HAZARD

IF GROUND FAULT IS INDICATED
ALL NORMALLY GROUNDED
CONDUCTORS MAY BE
UNGROUNDING AND ENERGIZED

LABEL LOCATION:
INVERTER(S), ENPHASE ENVOLV ENCLOSURE
(IF APPLICABLE),
PER CODE(S): NEC 2014: 690.15,
NEC 2014: 690.5(C), NEC 2011: 690.5(C)

WARNING

DUAL POWER SUPPLY

SOURCES: UTILITY GRID
AND PV SOLAR ELECTRIC
SYSTEM

LABEL LOCATION:
UTILITY SERVICE METER AND MAIN SERVICE
PANEL,
PER CODE(S): NEC 2014: 705.12(D)(3),
NEC 2011: 705.12(D)(4)

WARNING

PHOTOVOLTAIC SYSTEM
COMBINER PANEL

DO NOT ADD LOADS

LABEL LOCATION:
PHOTOVOLTAIC AC COMBINER (IF APPLICABLE),
PER CODE(S): NEC 2014: 705.12(D)(3)(a), NEC
2014: 705.12(D)(2)(9)(a), NEC 2011: 705.12(D)(4)

INVERTER #1

PHOTOVOLTAIC DC DISCONNECT

RATED MAXIMUM POWER-POINT CURRENT: 19.22 ADC
RATED MAXIMUM POWER-POINT VOLTAGE: 370 VDC
MAXIMUM SYSTEM VOLTAGE: 600 VDC
MAXIMUM SHORT CIRCUIT CURRENT: 18 ADC

LABEL LOCATION:
INVERTER(S), DC DISCONNECT(S),
PER CODE(S): NEC 2016: 690.53, NEC 2017: 690.53, NEC 2014: 690.53,
NEC 2011: 690.53

NOTES AND SPECIFICATIONS:

- SIGNS AND LABELS SHALL MEET THE REQUIREMENTS OF THE NEC 2019 ARTICLE 110.21(B), UNLESS SPECIFIC INSTRUCTIONS ARE REQUIRED BY SECTION 690, OR IF REQUESTED BY THE LOCAL A.H.J.
- SIGNS AND LABELS SHALL ADEQUATELY WARN OF HAZARDS USING EFFECTIVE WORDS, COLORS AND SYMBOLS.
- LABELS SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD AND SHALL NOT BE HAND WRITTEN.
- LABEL SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED.
- SIGNS AND LABELS SHALL COMPLY WITH ANSI Z535.4-2011, PRODUCT SAFETY SIGNS AND LABELS, UNLESS OTHERWISE SPECIFIED.
- DO NOT COVER EXISTING MANUFACTURER LABELS.

SOLAR PV SYSTEM
EQUIPPED WITH RAPID
SHUTDOWN

TURN RAPID
SHUTDOWN
SWITCH TO THE
"OFF" POSITION TO
SHUTDOWN PV
SYSTEM AND
REDUCE
SHOCK HAZARD
IN THE ARRAY

SOLAR
ELECTRIC
PV PANELS

PHOTOVOLTAIC SYSTEM
EQUIPPED WITH RAPID SHUTDOWN

LABEL LOCATION:
WEATHER RESISTANT MATERIAL, DURABLE PLAQUE, UL 969 AS STANDARD TO WEATHER RATING (UL
LISTING OF MARKINGS NOT REQUIRED), MIN 3/4" LETTER HEIGHT ARIAL OR SIMILAR FONT, NON-BOLD,
PLACED WITHIN 12" OF THE SERVICE DISCONNECT, PLACED ON THE OUTSIDE OF THE COVER WHEN
DISCONNECT IS OPERABLE WITH SERVICE PANEL CLOSED, (PER CODE: CEC690.12, 690.59(C))

CAUTION:
POWER TO THIS BUILDING IS ALSO SUPPLIED
FROM THE FOLLOWING SOURCES WITH
DISCONNECTS LOCATED AS SHOWN
255 BROADWAY

DITSON PL.

nrgtree

128 WARREN ST
LOWELL, MA 01852
Nrgtree CONSULTING LTD

REVISIONS

Description	Date	Rev
Initial Design	04/05/2023	00
Rev.	08/11/2023	01

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Project Name & Address

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Sheet Name

WARNING
LABELS

Sheet Size

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Sheet Number

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SOLAREEDGE OPTIMIZER CHART



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REVISIONS			
Description	Date	Rev	Rev
Initial Design	08/06/2023	00	
Rev.	08/11/2023	01	

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Project Name & Address

255 BROADWAY
255 BROADWAY,
METHUEN, MA 01844

Sheet Name
OPTIMIZER
CHART

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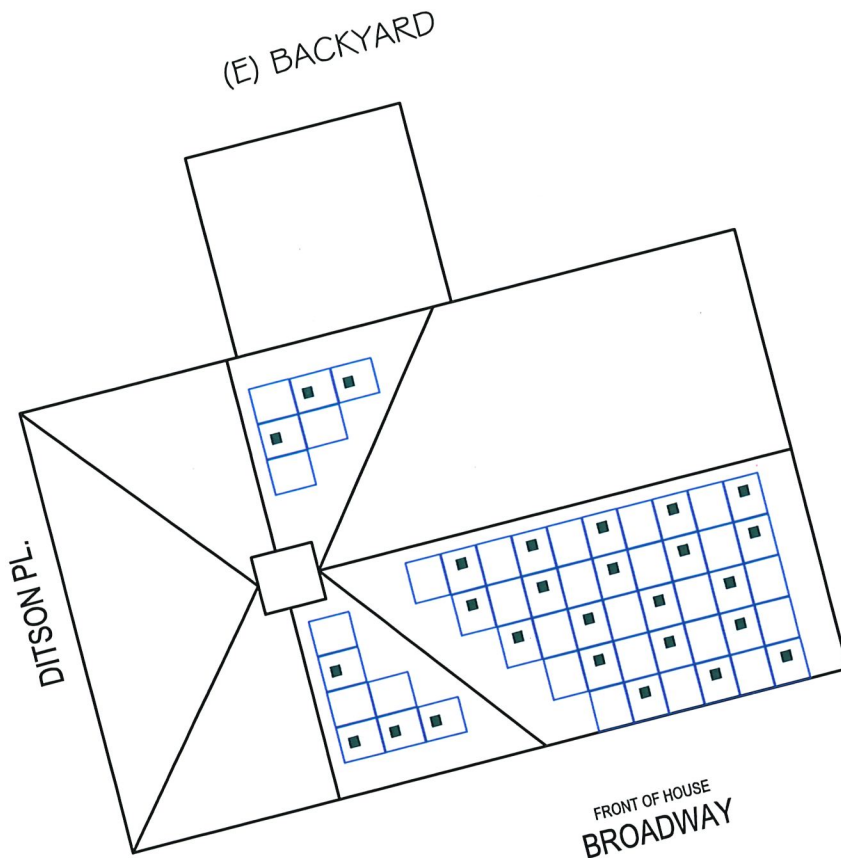
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Sheet Number

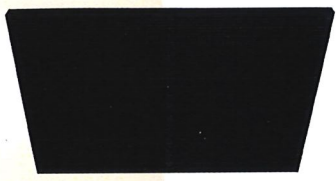
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HiKu6 (All-Black)

ALL BLACK MONO PERC

380 W ~ 405 W

CS6R-380 | 385 | 390 | 395 | 400 | 405MS-HL

MORE POWER

Module power up to 405 W
Module efficiency up to 20.7 %

Lower LCOE & system cost

Comprehensive LID / LetTID mitigation technology, up to 50% lower degradation

Better shading tolerance

MORE RELIABLE

Minimizes micro-crack impacts

Heavy snow load up to 8100 Pa,
Wind load up to 5000 Pa*

* For detailed information, please refer to the Installation Manual.

CSI SOLAR (USA) CO., LTD.

1350 Treat Blvd, Suite 500, Walnut Creek, CA 94598, USA | www.csisolar.com/na | service.ca@csisolar.com

25 Years Industry Leading Product Warranty on Materials and Workmanship*

25 Years Linear Power Performance Warranty*

1st year power degradation no more than 2%
Subsequent annual power degradation no more than 0.55%
*Subject to the terms and conditions contained in the applicable Canadian Solar Limited Warranty Statement. Also this 25-year limited product warranty is available only for products installed and operating under normal conditions.

MANAGEMENT SYSTEM CERTIFICATES*

ISO 9001:2015 / Quality management system
ISO 14001:2015 / Environmental management system
ISO 45001:2018 / International standards for occupational health & safety

PRODUCT CERTIFICATES*

IEC 61215 / IEC 61730 / CE
CEC listed (US California) / FSEC (US Florida)
UL 61730 / IEC 61701 / IEC 62716
Take-away



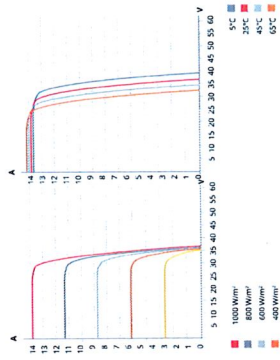
* The specific certificates applicable to different module types and markets will vary, and therefore not all of the certifications listed above are applicable to all markets. Please refer to the local Canadian Solar sales representative to confirm the specific certificates available for your Product and applicable in the regions in which the products will be used.

CSI SOLAR (USA) CO., LTD. is committed to providing high quality solar photovoltaic modules, solar energy and battery storage solutions to customers. The company was recognized as the No. 1 module supplier for quality and performance/price ratio in the IHS Module Customer Insight Survey. Over the past 20 years, it has successfully delivered over 70 GW of premium-quality solar modules across the world.

ENGINEERING DRAWING (mm)



CS6R-400MS-HL / I-V CURVES



ELECTRICAL DATA | STC*

CS6R-380/395/390/395/400/405MS-HL	380 W	385 W	390 W	395 W	400 W	405 W
Nominal Max. Power (Pmax)	380 W	385 W	390 W	395 W	400 W	405 W
Opt. Operating Voltage (Vmp)	30.0 V	30.2 V	30.4 V	30.6 V	30.8 V	31.0 V
Opt. Operating Current (Imp)	12.69 A	12.77 A	12.84 A	12.91 A	12.99 A	13.07 A
Open Circuit Voltage (Voc)	36.0 V	36.2 V	36.4 V	36.6 V	36.8 V	37.0 V
Short Circuit Current (Isc)	13.55 A	13.63 A	13.70 A	13.77 A	13.85 A	13.93 A
Module Efficiency	19.5%	19.7%	20.0%	20.2%	20.5%	20.7%
Operating Temperature	-40°C	-45°C	-45°C	-45°C	-45°C	-45°C
Max. System Voltage	1000V (IEC/UL)	1000V (IEC/UL)	1000V (IEC/UL)	1000V (IEC/UL)	1000V (IEC/UL)	1000V (IEC/UL)
Module Fire Performance	TYPE 2 (UL 61730 1000V) or CLASS C (IEC 61730)	TYPE 2 (UL 61730 1000V) or CLASS C (IEC 61730)	TYPE 2 (UL 61730 1000V) or CLASS C (IEC 61730)	TYPE 2 (UL 61730 1000V) or CLASS C (IEC 61730)	TYPE 2 (UL 61730 1000V) or CLASS C (IEC 61730)	TYPE 2 (UL 61730 1000V) or CLASS C (IEC 61730)
Max. Series Fuse Rating	25 A	25 A	25 A	25 A	25 A	25 A
Application Classification	Class A	Class A	Class A	Class A	Class A	Class A
Power Tolerance	0 ~ +10 W	0 ~ +10 W	0 ~ +10 W	0 ~ +10 W	0 ~ +10 W	0 ~ +10 W

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.

MECHANICAL DATA

Specification	Data
Cell Type	Mono-crystalline
Cell Arrangement	108 (2 X 9 X 6)
Dimensions	1722 ± 1134 × 35 mm (67.8 ± 44.6 × 1.38 in)
Weight	22.4 kg (49.4 lbs)
Front Cover	3.2 mm tempered glass with anti-ref-lective coating
Frame	Anodized aluminum alloy, IP68, 3 bypass diodes
J-Box	4 mm ² (IEC), 12 AWG (UL)
Connector	T6, MC4, MC4-EVO2 or MC4-EVO2A
Cable Length (including Connector)	1550 mm (61.0 in) (4' / 1100 mm (43.3 in))
Per Pallet	30 pieces
Per Container (40' HQ)	780 pieces

* For detailed information, please contact your local Canadian Solar sales and technical representatives.

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.34 % / °C
Temperature Coefficient (Voc)	-0.26 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	42 ± 3°C

PARTNER SECTION

* The specifications and key features contained in this datasheet may deviate slightly from our actual products. Please refer to the actual product for the most accurate information. CSI Solar Co., Ltd. reserves the right to make necessary adjustments to the information described herein at any time without further notice. Please do not rely on this information for any specific project. All products should be handled and installed by qualified people who have received specific training. CSI Solar Co., Ltd. and its partners certify the safety and installation instructions before using our PV modules.

CSI SOLAR (USA) CO., LTD.

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NRGTREE CONSULTING LTD

REVISIONS	Date	Rev
Initial Design	08/05/2023	01
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Sheet Name
EQUIPMENT
SPECIFICATIONS

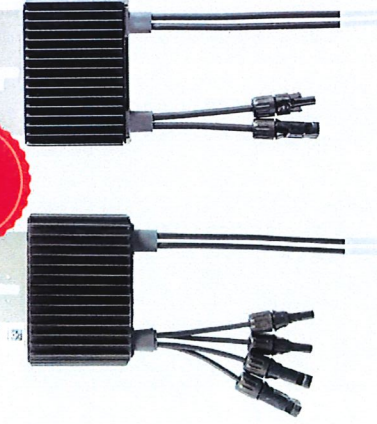
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P860 / P960 / P1101

25
YEAR
WARRANTY



The most cost-effective solution for commercial and large field installations

- Specifically designed to work with SolarEdge inverters
- Up to 25% more energy
- Superior efficiency (99.5%)
- Balance of System cost reduction: 50% less cables, fuses and combiner boxes, over 2x longer string lengths possible
- Fast installation with a single bolt
- Advanced maintenance with module-level monitoring
- Module-level voltage shutdown for installer and firefighter safety
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)



P860 / P960 / P1101

Maximum Output voltage

INSTALLATION SPECIFICATIONS

1	(-)0.16/0.52,	(-)0.16/0.52,
	(-)0.16/0.52,	(-)0.16/0.52,

(+)	16	/	52
(+)	16	/	52

(f) Rated power of the module at STC will not exceed the Power Optimizer "Rated Input DC Power". Modules with up to -5% power tolerance are allowed

Parallel Strips of Different Lengths or Orientations

- The same rules apply for Syntricity units of equivalent power ratings, that are part of the modular Syntricity Technology inventory

- (5) P860/P960 can be mixed in one string only with P860/P960
- (6) P860/P960 design with three phase ACB inverters is limited. Use the SolarEdge Designer for verification
- (7) To connect more 5.5C power loss string, design your project using SolarEdge Designer

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2531

Check Circle

Sheet Number

ACCEPTED MANUSCRIPT

Three Phase Inverters for the 120/208V Grid For North America SE10KUS / SE17.3KUS



The best choice for SolarEdge enabled systems

- / Specifically designed to work with power optimizers
 - / Quick and easy inverter commissioning directly from a smartphone using SolarEdge SetApp
 - / Fixed voltage inverter for superior efficiency and longer strings
 - / Built-in type 2 DC and AC Surge Protection, to better withstand lightning events
 - / Small, lightest in its class, and easy to install outdoors or indoors on provided bracket
- / Integrated arc fault protection and rapid shutdown for NEC 2014, 2017, and 2020, per article 690.11 and 690.12
 - / Built-in module-level monitoring with Ethernet, wireless or cellular communication for full system visibility
 - / Integrated Safety Switch
 - / UL1741 SA and SB certified, for CPUC Rule 21 grid compliance

solaredge.com



INVERTERS

/ Three Phase Inverters for the 120/208V Grid⁽¹⁾ For North America SE10KUS / SE17.3KUS

Model Number	SE10KUS	SE17.3KUS
Applicable to Inverters with part number	SEXXK-UP2XXXX	SE7.3KUS

OUTPUT		W	V _A
Rated AC Power Output	10000	17300	17300
Maximum Apparent AC Output Power	10000		
AC Output Line Connections	3W + PE, 4W + PE		
AC Output Voltage: Minimum-Nominal-Maximum ⁽²⁾ (L-N)	105 ~ 170 ~ 137.5		V _{AC}
AC Output Voltage: Minimum-Nominal-Maximum ⁽²⁾ (L-L)	183 ~ 208 ~ 229		V _{AC}
AC Frequency: Minimum-Nominal-Maximum ⁽³⁾	59.3 ~ 60 ~ 60.5		Hz
Continuous Output Current (per Phase)	27.8	48.25	
GPD Threshold	1		A
Utility Monitoring: Islanding Protection: Country Configurable	Yes		
Set Points:			
THD	≤ 3		%
Power Factor Range	+/- 0.85 to 1		
INPUT		W	V _{AC}
Maximum DC Power (Module STC)	17500	30275	
Transformer-less, Ungrounded	Yes		
Maximum Input Voltage DC+ to DC-	600		V _{DC}
Operating Voltage Range	370 ~ 600		V _{DC}
Maximum Input Current	27.8	48.25	A _{DC}
Maximum Input Short Circuit Current	55		A _{DC}
Reverse-Polarity Protection	Yes		
Ground-Fault Isolation Detection	16740 Separately ⁽⁴⁾		
CEC Weighted Efficiency	97	97.5	%
Night-time Power Consumption	< 4		W
ADDITIONAL FEATURES			
Supported Communication Interfaces	2 x RS485, Ethernet, Cellular (optional)		
Inverter Commissioning	With the SetApp mobile application using built-in Wi-Fi, access point for local connection		
Rapid Shutdown	NEC2014, NEC2017 and NEC2020 compliant/certified		
RS485 Surge Protection Plug-in	Supplied with the inverter, Built-in		
AC DC Surge Protection	Type II, field replaceable, Built-in		
DC Fuses (Single Pole)	25A, Built-in		
Smart Energy Management	Export Limitation		
DC SAFETY SWITCH			
DC Disconnect	Integrated		
STANDARD COMPLIANCE			
Safety	UL1741, UL1741 SA, UL1741 SB, UL9996, CSA C22.2, Canadian AECI according to I.T.L. M-07		
Grid Connection Standards:	IEEE1547-2018, Rule 21, Rule 14 (H)		
Emissions	FCC part15 class A		
INSTALLATION SPECIFICATIONS			
AC Output Conduit Size (AWG) range	1/2" or 7/8" - 10 AWG		
DC Input Conduit Size (AWG) range	3/4" or 7/8" - 12 AWG		
Number of DC Input Poles	4		
Dimensions with Safety Switch (H x W x D)	31.8 x 12.5 x 11.8 / 808 x 317 x 300		in / mm
Weight with Safety Switch	78.2 / 35.5		lb / kg
Cooling	Fans (user replaceable)		
Noise	< 62		dBA
Operating Temperature Range	-40 to +140 / -40 to +60(4)		°F / °C
Protection Rating	NEMA 3B		
Mounting	Bracket provided		

(1) 1) For 277/480V inverters refer to the Three Phase Inverters for the 277/480V Grid for North America datasheet

(2) 2) For other regional settings please contact SolarEdge support

(3) 3) Where permitted by local regulations

(4) 4) For power de-rating, refer to the Temperature Derating... Technical Note (North America)

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Description	Rev
Initial Design	08/04/2023 01
Rev.	08/11/2023 01

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Project Name & Address

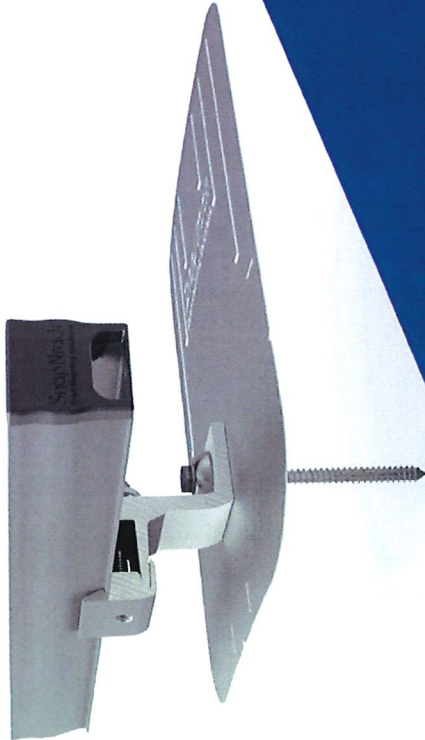
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Sheet Name
EQUIPMENT
SPECIFICATIONS

Sheet Size
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SnapNrack™

Solar Mounting Solutions

Ultra Rail

Residential Roof Mount System

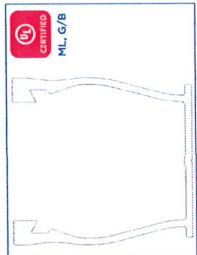
Installation Manual

snapnrack.com

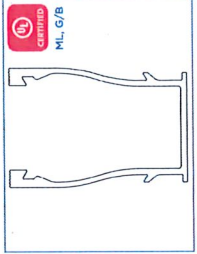
Component Details

snapnrack.com

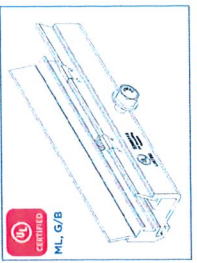
Structural Components



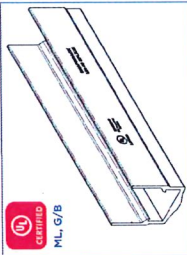
UR-40 Rail
UR-40 rail for Ultra Rail roof mount racking system



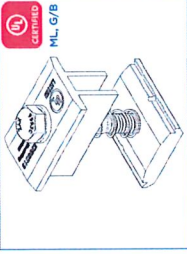
UR-60 Rail
UR-60 rail for Ultra Rail roof mount racking system



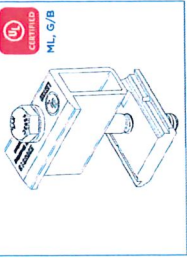
UR-40 Rail Splice
UR-40 rail splice component including two splice halves and hardware



UR-60 Rail Splice
UR-60 rail splice component including slide-on sleeve and hardware

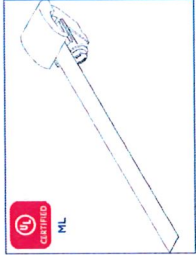


Mid Clamp
Top-down module mid clamp including clamp and hardware

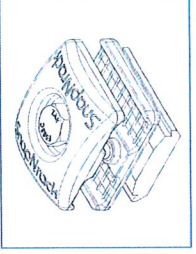


Adjustable End Clamp
Top-down module end clamp including clamp and hardware

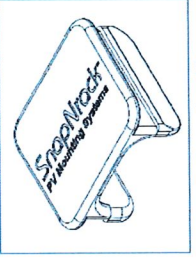
Wire Management/Grounding Component



Universal End Clamp
Bottom-mount module end clamp including clamp and hardware



Universal Wire Clamp
Wire management component used to secure conductors between rails



Wire Retention Clip
Wire management component used to secure conductors in rails

UL Listing Legend:
ML - Evaluated for Mechanical Loading
G/B - Evaluated for Grounding/Bonding

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Description	Date	Rev	
Initial Design	08/02/2023	00	
Rev.	09/11/2023	01	
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Project Name & Address			
255 BROADWAY 255 BROADWAY, METHUEN, MA 01844			
Sheet Name		EQUIPMENT SPECIFICATIONS	
Sheet Size		ANSI B 11" X 17"	
Sheet Number		E1.9	
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L Foot Mount

snapptrack.com

L Foot Mount

snapptrack.com

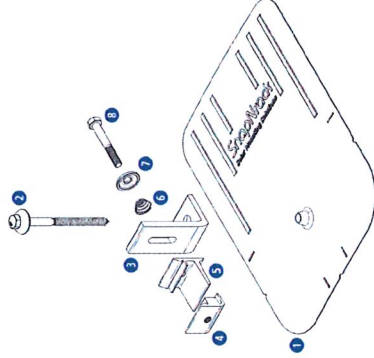
Required Tools

- Hammer or Stud Finder
- Torque Wrench
- Roof Marking Crayon
- Socket Wrench

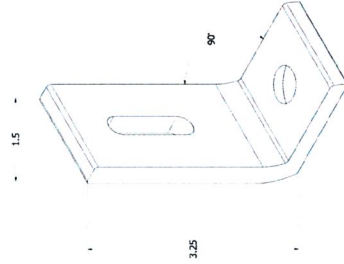
- Drill with 3/16" Pilot Drill Bit
- 1/2" Socket
- Roof Sealant

Materials Included - L Foot Mount

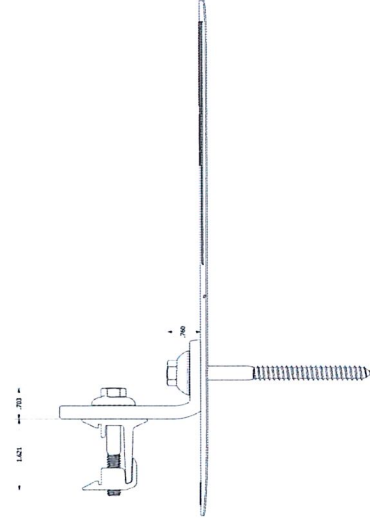
- 1 SnapTrack Comp Umbrella Flashing
- 2 SnapTrack Umbrella Lag Screw
- 3 SnapTrack Umbrella L Foot
- 4 SnapTrack Ultra Mount (Tapped)
- 5 SnapTrack Ultra Mount (Thru-Hole)
- 6 SnapTrack Ultra Mount Spring
- 7 SnapTrack Ultra Mount Spring Cage
- 8 5/16"-18 X 2-1/4" SS HCS Bolt



Application Note:
Install on composition shingle roofs.

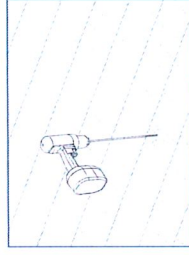


Dimensioned L Foot

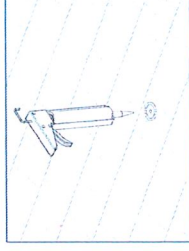


Dimensioned L Foot Assembly

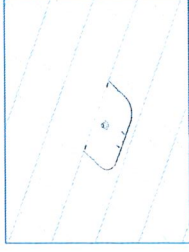
INSTALLATION INSTRUCTIONS



- 1) Using roof attachment locations drawn during system layout, drill a pilot hole through the roofing material into the roof framing member.

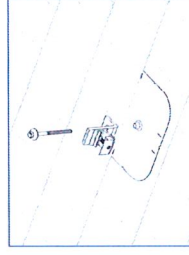


- 2) Apply roofing sealant in and around the pilot hole, and directly onto the lag screw to ensure a water tight seal.

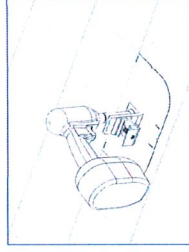


- 3) Pry up shingles with a breaker bar and install flashing underneath shingle course above pilot hole, and position flashing so cone is in line with pilot hole.

Install Note:
Ensure flashing extends minimum (2) courses above pilot hole, and does not overhang bottom edge of shingle course.
Apply a horseshoe of sealant under flashing to direct water away from penetration.



- 4) Insert Umbrella Lag Screw through Umbrella L Foot and cone in flashing, then drive lag screw for minimum 2.5" embedment into the roof framing member.



Best Practice:
If using an impact driver, finish tightening lag screw with a hand wrench to prevent L Foot from rotating.

Install Note:
The L Foot can be attached in any orientation.

REVISIONS		
Description	Date	Rev
Initial Design	04/01/2023	00
Rev.	06/11/2023	01

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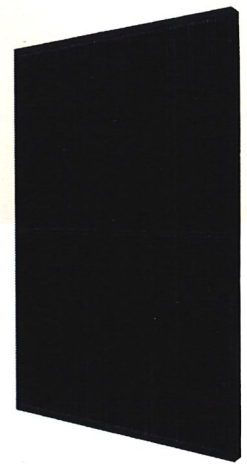
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Sheet Name
**EQUIPMENT
SPECIFICATIONS**

Sheet Size
**ANSI/B
11" X 17"**

Sheet Number
E1.10

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HiKu6 (All-Black)

ALL BLACK MONO PERC

380 W ~ 405 W

CS6R-380 | 385 | 390 | 395 | 400 | 405MS-HL

MORE POWER



Module power up to 405 W
Module efficiency up to 20.7 %



Lower LCOE & system cost



Comprehensive LID / LeTID mitigation technology, up to 50% lower degradation



Better shading tolerance

MORE RELIABLE



Minimizes micro-crack impacts



Heavy snow load up to 8100 Pa,
wind load up to 5000 Pa*



Industry Leading Product Warranty on Materials and Workmanship*



Linear Power Performance Warranty*

1st year power degradation no more than 2%

Subsequent annual power degradation no more than 0.55%

*Subject to the terms and conditions contained in the applicable Canadian Solar Limited Warranty Statement. Also this 25-year limited product warranty is available only for products installed and operating on residential rooftops in certain regions.

MANAGEMENT SYSTEM CERTIFICATES*

ISO 9001:2015 / Quality management system
ISO 14001:2015 / Standards for environmental management system
ISO 45001: 2018 / International standards for occupational health & safety

PRODUCT CERTIFICATES*

IEC 61215 / IEC 61730 / CE
CEC listed (US California) / FSEC (US Florida)
UL 61730 / IEC 61701 / IEC 62716
Take-e-way



* The specific certificates applicable to different module types and markets will vary, and therefore not all of the certifications listed herein will simultaneously apply to the products you order or use. Please contact your local Canadian Solar sales representative to confirm the specific certificates available for your Product and applicable in the regions in which the products will be used.

CSI SOLAR (USA) CO., LTD. is committed to providing high quality solar photovoltaic modules, solar energy and battery storage solutions to customers. The company was recognized as the No. 1 module supplier for quality and performance/price ratio in the IHS Module Customer Insight Survey. Over the past 20 years, it has successfully delivered over 70 GW of premium-quality solar modules across the world.

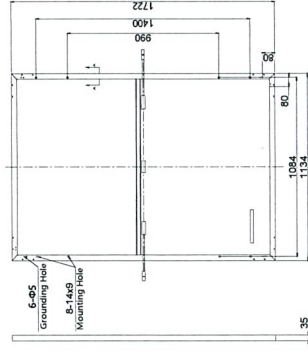
* For detailed information, please refer to the Installation Manual.

CSI SOLAR (USA) CO., LTD.

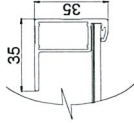
1350 Treat Blvd. Suite 500, Walnut Creek, CA 94598, USA | www.csisolar.com/na | service.ca@csisolar.com

ENGINEERING DRAWING (mm)

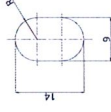
Rear View



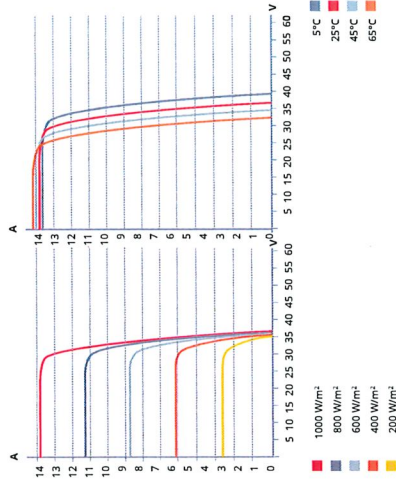
Frame Cross Section A-A



Mounting Hole



CS6R-400MS-HL / I-V CURVES



ELECTRICAL DATA | STC*

CS6R-380/385/390/395/400/405MS-HL

Nominal Max. Power (Pmax)	380 W	385 W	390 W	395 W	400 W	405 W
Opt. Operating Voltage (Vmp)	30.0 V	30.2 V	30.4 V	30.6 V	30.8 V	31.0 V
Opt. Operating Current (Imp)	12.69 A	12.77 A	12.84 A	12.91 A	12.99 A	13.07 A
Open Circuit Voltage (Voc)	36.0 V	36.2 V	36.4 V	36.6 V	36.8 V	37.0 V
Short Circuit Current (Isc)	13.55 A	13.63 A	13.70 A	13.77 A	13.85 A	13.93 A
Module Efficiency	19.5%	19.7%	20.0%	20.2%	20.5%	20.7%
Operating Temperature	-40°C ~ +85°C					
Max. System Voltage	1000V (IEC/UL)					
Module Fire Performance	TYPE 2 (UL 61730 1000V) or CLASS C (IEC 61730)					
Max. Series Fuse Rating	25 A					
Application Classification	Class A					
Power Tolerance	0 ~ +10 W					

* Under Standard Test Conditions (STC) of Irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.

ELECTRICAL DATA | NMOT*

CS6R-380/385/390/395/400/405MS-HL

Nominal Max. Power (Pmax)	284 W	288 W	291 W	295 W	299 W	303 W
Opt. Operating Voltage (Vmp)	28.1 V	28.3 V	28.4 V	28.6 V	28.8 V	29.0 V
Opt. Operating Current (Imp)	10.12 A	10.19 A	10.26 A	10.33 A	10.39 A	10.45 A
Open Circuit Voltage (Voc)	33.9 V	34.1 V	34.2 V	34.4 V	34.6 V	34.7 V
Short Circuit Current (Isc)	10.91 A	10.98 A	11.05 A	11.11 A	11.17 A	11.23 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. CSI Solar Co., Ltd. reserves the right to make necessary adjustment to the information described herein at any time without further notice.
Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.

MECHANICAL DATA

Specification	Data
Cell Type	Mono-crystalline
Cell Arrangement	108 [2 X (9 X 6)]
Dimensions	1722 x 1134 x 35 mm (67.8 x 44.6 x 1.38 in)
Weight	22.4 kg (49.4 lbs)
Front Cover	3.2 mm tempered glass with anti-ref-lective coating
Frame	Anodized aluminium alloy,
J-Box	IP68, 3 bypass diodes
Cable	4 mm ² (IEC), 12 AWG (UL)
Connector	T6, MC4, MC4-EVO2 or MC4-EVO2A
Cable Length (Including Connector)	1550 mm (61.0 in)(+) / 1100 mm (43.3 in)(-)*
Per Pallet	30 pieces
Per Container (40' HQ)	780 pieces

* For detailed information, please contact your local Canadian Solar sales and technical representatives.

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.34 % / °C
Temperature Coefficient (Voc)	-0.26 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	42 ± 3°C

PARTNER SECTION